



Targeted radioactive treatment offers promise in cancer treatment

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Cancer is one of the leading causes of death across the world — it is estimated that there will be more than 600,000 cancer deaths in the United States this year — and despite billions of dollars that go toward cancer research, a cure remains elusive. But a radioactive isotope produced at Los Alamos National Laboratory could be a new breakthrough in cancer treatment.

Cancer starts when normal cells begin to undergo mutations. Normally the body can detect and repair these mutations, or damage to DNA, but when it misses them, cancerous cells can spread into nearby tissues or can metastasize to other organs.

Cancer is hard to cure for many reasons: there are more than 100 types of cancer, the cells evolve and mutate into different types of cancer, and cancers can become more resilient. Because of these factors, it is unlikely that there can ever be a single cure for all cancer, so new approaches are still needed.

In 2015, the Department of Energy's Office of Science, Office of Nuclear Physics, Isotope Development and Production for Research and Applications Program launched a program to develop and provide a supply of actinium-225.

It is a rare, radioactive medical isotope that may just hold the cure to some types of cancer. Los Alamos National Laboratory produces actinium-225 for use in targeted radiotherapy and it will soon be tested on volunteer patients. Early results elsewhere are promising.

Actinium-225 can attach to molecules that target only cancer cells, without harming neighboring health cells. In clinical trials treating late-stage prostate cancer patients, it wiped out the cancer in just three treatments. Other clinical trials focused on a variety of cancer types including leukemia, lymphoma, melanoma, glioma and neuroendocrine tumors.

The [full version of this story](#) first appeared in the Science on the Hill column in the Santa Fe New Mexican, which highlights Laboratory science.

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